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ROLE OF MICRO-COMPUTERS IN AFRICA

THE REVOLUTION OF MICRO-PROCESSOR AND THE ROLE OF MICRO-COMPUTERS IN AFRICA

1. From sophisticated telecommunication satellites to digital watches and miniaturized calculators each can afford, micro-electronics has, in its 30 years of history invaded every area of human activity. The accelerated rate and the increasing innovative vitality of this new technology is unprecedented in modern times.

2. With the nuclear energy and the conquest of space, informatices is the most fundamental innovation of the XX century. It has allowed all sciences to develop at such a speed that it has become the privileged tool of a new social orgnanization and the basis of modern culture.

3. Though it is not the purpose of this paper to deal at length with the various types of computer technology, we can try to define a microprocessor and a microcomputer for better understanding.

4. A microprocessor is the data processing part of a microcomputer, based on one or more "Large Scale Integrated" (LSI) circuits and forming a functionally complete entity comprising an arithmetic unit, registers and a control unit.

5. A microcomputer is a complete computer unit, containing microprocessors, memories and input/output interconnection units.

6. The development of data processing by mini and microcomputers makes available means for automatic data processing at costs which appear ridiculously low compared with those of a few years ago. For the same performance, the price of microprocessors has fallen one hundred fold over the past five years and it is still decreasing.

7. In 1970 it was considered an achievement to group about 100 transistors in a single integrated circuit of a few square centimeters. Today the figure is 20,000 to 30,000 and it is virtually doubling every year. The same trend applies for the size and cost of memories.

8. This reduction in costs explains the spectacular growth in the use of data processing which has been a feature of our era and affects practically all sectors of human activities.

9. The advent of microprocessors which can group thousands of transistors on infinitesinal spaces for a very low cost also gives to the poorest States the possibility to acquire, for low charges, information processors of a considerable power, of a perfect reliability and a very simple operation system.

10. The present trend is on the one hand to develop data systems with increasing capacity and sophisticated performance and on the other hand to miniaturize integrated circuits. More than often, these two elements are intertwined as minicomputers are incorporated in major data processing systems.

11. If we take as a concrete example the equipment we have in our own possession the evolution is fascinating:

HP CPU

1972	HP 3000
1974	HP 3000CX
1976	HP 3000 Series II
1977	HP 3000 Series I
	CX Recycled
1978	HP 3000 Series III
1978	HP 3000 Series 33
1979	HP 3000 Series 30
1980	HP 3000 Series 44
1981	HP 3000 Series 40
1981	HP 3000 Series 64

HP DISC DRIVE

Type	Capacity
7911	28Mb
2888	47Mb
7912	65Mb
	120Mb
7933	404Mb

Memory

HP Computer Performance

Year	Type	Basic	Maximum
1972	HP 3000	64Kb	96Kb
1974	HP CX	96Kb	128Kb
1976	HP 3000 Series II	128Kb	512Kb
1977	HP 3000 Series I	-	-
1978	HP 3000 Series III	256Kb	2Mb
1979	HP 3000 Series 33	-	-
1979	HP 3000 Series 30	-	-
1980	HP 3000 Series 44	1 Mb	4Mb
1981	HP 3000 Series 40	256Kb	2Mb
1981	HP 3000 Series 64	2Mb	8Mb

HP Prices in US$

Year	Type	Basic Memory	Maximum Memory
1972	HP 3000	95,000	-
1974	HP 3000 CX	129,500	203,000
1976	HP 3000 Series II	110,000	190,000
1977	HP 3000 Series I	75,000	-
1978	HP 3000 Series III	115,000	-
1979	HP 3000 Series 30	49,750	-
1980	HP 3000 Series 44	109,000	-
1981	HP 3000 Series 40	50,000	-
198	HP 3000 Series 64 (one million instructions per second/upto 3.2 Gb Disc Storage)	164,700	-

Operating System and Software

Year	Operating System	Software
1972	MPE I	
1974	IMAGE (Data base management System) QUERY (DBMS query language) RJE (Data Communication emulation)	Cobol Basic, Fortran RPG, SPL
1976	MPE III DEL/3000 (Data Entry Library)	
197	APL/3000	
1977	KSAM/3000	
1977	DS/3000	
1978	MRSE and MTS (data communication)	
1978	MPE III	
1980	MPE IV	

12. Information processed through microprocessors upgrades the quality and sophistication of decision making and policy. Considering that the problem is not a lack of information but a systematization of information and its timely availability to the appropriate users, developing countries should enhance their capacity accordingly now that they are aware that "knowledge is indeed power".

13. The development of telecommunication networks, digital and satellite transmission systems allow the transfer of information at a considerable distance and at great speed for still low costs, as well as the accession from terminals spread all over the world to data banks of illimited storage capacity.

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14. The design of small machines and the decentralization of information networks open therefore to developing countries wide possibilities based on a technology they still do not possess. There lies the risk of domination and alienation underlined by all concerned authorities.

15. The proliferation of international information systems helps to reduce the dependancy of developing countries on the industrialized North by redistributing access to knowledge so that it is no longer simply a function of material capabilities.

16. The technological advance of the last 30 years, the new technologies in the field of informations, have certainly found developing countries unforwarned and unprepared to absorbe them fully and rapidly. This is mainly due to the lack of basic know-how and adequate infrastructure favorable to innovative development.

17. And yet, the advancement over the next decades of all developing countries and the African region in particular, depends mostly on their urgent and appropriate response to the challenges posed by the new technological achievements.

18. Nonetheless, Africa should learn from experience that it should assume the responsibility of identifying its needs and directing its policies to avoid arbitrary importing of products of new technology from advanced countries.

19. The real option for Africa would therefore be to combine its domestic development with the acquisition of new technology geared to the solution of fundamental social and economic problems of the region.

20. To benefit from the use of microcomputers, African governments should take the necessary steps to provide both the material and human environment into which it shall be introduced.

21. The extremely high costs of equipments and the complexity of their operation used to limit inevitably the use of computers in African countries with limited resources and few technicians.

22. With the production of microcomputers, an interesting option is created to solve problems raised by the excessive centralization of data processing.

23. At a lower cost, a higher processing capacity and simpler operation systems, the microcomputer has given to African States the possibility to acquire in advantageous conditions, means of processing directly their information with the assistance of non-specialists.

24. It has become of common acceptance that "brains" are more and more substituted for "muscles" and that no future development is conceivable without using electronics at one level or the other.

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25. Africa is also realizing that it cannot disregard this revolution and dissociate itself from it. It should rather engage itself in certain fundamental preparations such as the training of computer scientists and progressive application of computer science in view of a better integration in this new technological revolution.

26. The establishement of the Pan-African Documentation and Information System in 1980, upon the expressed wishes of Member States of the Economic Commission for Africa, is a further step towards an increased utilization of computer science for the socio-economic development of the region.

27. The Third Session of the Joint Conference of African Planners, Statisticians and Demographers will be an interesting forum for the discussion of the impact of the technological revolution of microprocessors and the role of microcomputers in Africa.

28. The Conference is expected to examine thoroughly the needs and priorities for application of computer technology in Africa according to the objectives of the Lagos Plan of Action.

29. The Conference is also expected to recommend the further enhancement of government policies with the assistance of the Pan-African Documentation and Information System and the United Nations in general for coordinated activities at the national, sub-regional and regional levels for the promotion of new technological applications in Africa.